REMARKS

This Amendment is responsive to the June 12, 2008 Office Action. In the Office Action, claims 11-17 and 19-21 stand rejected and claims 1-7, 9 and 10 are indicated as allowable. Claims 11, 15-17 and 19 have been amended. Support for the claim amendments may be found, for example, on page 8, lines 1-4; page 11, lines 10-13; and page 12, lines 5-22 of the specification. Claims 1-7, 9-17 and 19-21 are pending.

Rejections Under 35 U.S.C. §103

Claims 11-17, and 19-21 stand rejected under 35 U.S.C. §103(a) for obviousness over United States Publication No. 2004/0099608 to Leffler et al., United States Patent No. 5,358,643 to McClintock, and United States Patent No. 4,085,028 to McCallum in view of United States Patent No. 5,624,535 to Tsuchikawa et al. In view of the foregoing amendments and the comments below, reconsideration of this rejection is respectfully requested.

Amended claim 11 is directed to an apparatus for treating ballast water in a ship, including a ballast tank installed in a lower portion of the ship for storing ballast water, an intake pump for taking in seawater and supplying the seawater to the ballast tank so as to use for the ballast water, an electrolyzer positioned between the ballast tank and the intake pump for electrolyzing the seawater supplied to the ballast tank from the intake pump, and a controller controlling a direct-current voltage supply to the electrolyzer and controlling the intake pump so as to adjust an NaOCl density of the ballast water contained in the ballast tank.

Amended claim 17 is directed to a method for treating ballast water in a ship using electrolysis, including the steps of: taking in seawater by an intake pump for storing ballast water in a ballast tank; passing the taken-in seawater through an electrolyzer where electrodes for electrolysis are installed to generate electrolyzed water containing NaOCl; allowing the electrolyzed water containing NaOCl to flow into the ballast tank; measuring an NaOCl density from the ballast water in the ballast tank; and controlling the NaOCl density in the ballast water until the density reaches a required density by adjusting supply of a

direct-current voltage to the electrolyzer and adjusting an intake amount of the seawater using an intake pump depending on the measuring results.

Thus, the present invention, as recited in amended claims 11 and 17, takes in seawater from the sea via an intake pump, seawater is electrolyzed by an electrolyzer, and electrolyzed water is then supplied into the ballast tank. Further, a controller controls the electrolyzer and the intake pump to adjust the NaOCl of the ballast water in the ballast tank. Therefore, the NaOCl density of the ballast water is adjusted according to the supplied amount of electrolyzed water and/or the supplied amount of non-electrolyzed water, *i.e.*, seawater.

The cited references fail to teach or suggest the present invention as recited by amended claims 11 and 17. In particular, none of the cited references teaches or suggests controlling the amount of electrolyzed water and the amount of non-electrolyzed water, *i.e.*, seawater, supplied into the ballast tank for adjusting the NaOCl density of the ballast water in the ballast tank as recited by claims 11 and 17.

The Tsuchikawa patent generally discloses a production system capable of constantly producing electrolyzed water with a desired chemical property. For producing electrolyzed water with a desired chemical property, Tsuchikawa discloses an electrolyzer (30) having two chambers, namely a cathode chamber (33) and an anode chamber (32). The cathode chamber (33) is connected to a lower brine take (20) through a conduit (46) and diluted brine is supplied to the cathode chamber (33) from the lower brine tank (20) by a hydraulic pump (44). The diluted brine supplied into the cathode chamber (33) is electrolyzed to alkaline water, which is then discharged through an outlet duct (49). The alkaline water is not supplied into the lower brine tank (20). The anode chamber (32) is also connected to the lower brine tank (20) through a conduit (45) and the diluted brine is supplied to the anode chamber (32) from the lower brine tank (20) by a hydraulic pump (43). Further, the diluted brine supplied into the anode chamber (32) is electrolyzed to acid water, and the acid water is discharged through an outlet duct (48) (see column 2, line 56 to column 3, line 7).

The Tsuchikawa patent, however, fails to teach or suggest the feature of controlling the amount of electrolyzed water and the amount of non-electrolyzed water, *i.e.*, seawater, supplied into the ballast tank for adjusting the NaOCl density of the ballast water in the ballast tank as recited by claims 11 and 17. In the production system of the Tsuchikawa patent, the alkaline water and the acid water do not return to the lower brine tank (20). The concentration of the diluted brine in the lower brine tank (20) is adjusted by supplying brine from the upper brine tank (10) so as to constantly produce electrolyzed water with a desired chemical property by the cathode chamber (22) and the anode chamber (32). That is, the diluted brine is adjusted with a desired concentration and is supplied into the cathode chamber (33) and the anode chamber (32) for producing electrolyzed water with a desired chemical property.

The Leffler, McClintock, and the McCallum references fail to overcome the deficiencies of the Tsuchikawa patent. The Leffler publication discloses a ballast water treatment system having a ballast tank (26), electrolysis cells (16), and a pump (unnumbered) (see Fig. 1). The Office Action relies upon the McClintock patent and the McCallum patent to teach a system having multiple pumps and a controller for supplying power to an electrolyzer, respectively. The cited references, however, fail to teach or suggest the control of the NaOCl density of the ballast water in the ballast tank by adjusting supply of a direct-current voltage supply to the electrolyzer and adjusting the intake pump as recited in amended independent claims 11 and 17.

Furthermore, assuming the cited references disclose all of the features of the present invention, Applicants respectfully submit that one of ordinary skill in the art would not have recognized that the results of the combination were predictable as asserted in the Office Action at page 3. In particular, the Tsuchikawa patent is generally directed to a production system for constantly producing electrolyzed water with a desired chemical property. Thus, the Tsuchikawa patent, as discussed above, has different technical features from the Leffler, McClintock, and the McCallum references, which are generally directed to treatment systems.

Claims 12-16 and 18-21 depend from and add further limitations to independent claims 11 and 17 and are deemed to be in condition for allowance for all the reasons discussed above with respect to independent claims 11 and 17.

Therefore, for at least the foregoing reasons, reconsideration and withdrawal of this rejection are respectfully requested.

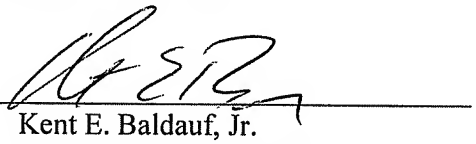
Conclusion

In view of the foregoing amendments and comments, Applicants respectfully request reconsideration of the rejection of claims 11-17 and 19-21 and allowance of pending claims 1-7, 9-17, and 19-21.

Should the Examiner have any questions regarding this information or wish to discuss this matter in further detail to advance prosecution, the Examiner is invited to contact Applicants' undersigned representative by telephone at the number provided below.

Respectfully submitted,

THE WEBB LAW FIRM

By 

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